

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA5 | Northolt Corridor

Operational assessment (SV-004-005)

Sound, noise and vibration

November 2013

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Department
for Transport

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Appendix SV-004-005

Environmental topic:	Sound, noise and vibration	SV
Appendix name:	Operation assessment	004
Community forum area:	Northolt Corridor	005

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1 Introduction

1.1 Structure of the sound, noise and vibration appendices

- 1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these details the methodology used (Appendix SV-001-000) and relates to the sound, noise and vibration assessment for all community forum areas (CFA).
- 1.1.2 For the Northolt Corridor community forum area (CFA05), the other three sections are as follows:
- baseline sound, noise and vibration (Appendix SV-002-005);
 - construction sound, noise and vibration (Appendix SV-003-005); and
 - operational sound, noise and vibration (Appendix SV-004-005) (this appendix).
- 1.1.3 The outcomes of this assessment are summarised in Volume 2: CFA05 Report, Chapter 11 Sound, Noise and Vibration.
- 1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5 sound, noise and vibration map book.
- 1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the operation of the Proposed Scheme for the Northolt Corridor area on:
- people, primarily where they live ('residential receptors') in terms a) individual dwellings and b) on a wider community basis, including any shared community spaces; and
 - community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.
- 1.1.6 The assessment of likely impacts, effects and significant effects from operational noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:
- Agriculture, forestry and soils Appendix AG-001-005
 - Community Appendix CM-001-005
 - Ecology Appendix EC-005-001
 - Heritage Appendix CH-003-005
 - Landscape and Visual Appendix LV-001-005

1.2 Evaluation of impacts and effects

- 1.2.1 This appendix provides a quantitative assessment of operational noise and vibration impacts and effects and a qualitative assessment of likely significant effects, based on the impacts and effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.

- 1.2.2 Indirect effects arising from permanent changes in traffic patterns on the existing road and rail networks as a consequence of the Proposed Scheme are also reported in this appendix, where they would occur within the study area as defined in Volume 5: Appendix SV-001-000.
- 1.2.3 Route-wide impacts, effects and significant effects associated with noise or vibration from the operation of the Proposed Scheme are reported in Volume 3.
- 1.2.4 Off-route effects of noise or vibration arising from the operation of the Proposed Scheme, including those likely to arise from permanent changes in traffic patterns on roads or railways outside of the study area for direct effects are reported in Volume 4.
- 1.2.5 In undertaking the assessment of sound, noise and vibration, consistent with EIA Regulations and emerging National Planning Practice Guidance¹ a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV001-000.
- 1.2.6 The assessment of impacts has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The Assessment Locations employed in this assessment are presented on map series Sv-02 in the CFA05 Volume 5 sound, noise and vibration map book.

¹ National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk> ; refer to the table summarising noise exposure hierarchy

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group (Acoustics) information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group (Acoustics) the following local policy guidance on noise and vibration has been identified:

- London Borough of Ealing - Supplementary Planning Guidance (SPG10) Noise and Vibration; and
- London Borough of Ealing– Unitary development plan - 2004

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5: Appendix SV-001-000.

2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1, Section 8.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration
- September / October 2012; a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November / December 2012; specific request for the Community Forum to propose baseline sound monitoring locations;
- January / February 2013; feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal / written response to questions on sound, noise and vibration.

2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1), is clarified in a number of areas by the SMR addendum (Volume 5: Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

- 2.4.1 Route-wide assumptions are outlined in Volume 1, Section 8, and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of operational sound noise and vibration within this CFA are set out in Volume 2: Report 05.

2.5 Local limitations

- 2.5.1 In this area, there are a number of locations where the land or property owners did not permit baseline sound level monitoring to be undertaken at their premises. However, sufficient information has been obtained to undertake the assessment. Further information is provided in Volume 5: Appendix SV-002-005.

3 Environmental baseline

3.1 Existing baseline

- 3.1.1 Details of the baseline data collection and the methodology are given in Appendix SV-001-000 and specifically for this study area in Appendix SV-002-005. The majority of receptors adjacent to the line of the route are not currently subject to appreciable vibration and therefore vibration at all receptors has been assessed using the absolute vibration criteria as described in Volume 5: Appendix SV-001-000.

3.2 Future baseline

- 3.2.1 The operational sound, noise and vibration assessment assumes a baseline year of 2026. The approach to scaling the baseline from the survey year to 2026 is presented in Appendix SV-001-000 and specifically for this CFA in Appendix SV-002-005.

4 Effects arising during operation

4.1 Introduction

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is:

- Avoidance and mitigation measures
- Quantitative identification of impact and effects
 - Ground-borne sound and vibration
 - Residential
 - Non-residential
- Assessment of impacts and effects
 - Residential receptors: direct effects – dwellings
 - Residential receptors: direct effects – communities
 - Residential receptors: indirect effects
 - Non-residential receptors: direct effects
 - Non-residential receptors: indirect effects
 - Cumulative effects from the proposed scheme and other committed development.

4.2 Avoidance and mitigation measures

4.2.1 These are set out in Volume 2: Report 05.

4.2.2 Additionally, within this area the Vibration Additional Mitigation Case track has been assumed in the tunnels from Bideford Avenue to the western end of Selbourne Gardens and in the vicinity of Carr Road. Further information is presented in Volume 5: Appendix SV-001-000.

4.3 Quantitative identification of impacts and effects

Ground-borne sound and vibration

4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown on map series SV-02 in the CFA05 Volume 5 sound, noise and vibration map book.

4.3.2 For each Assessment Location, the assessment results for residential and non-residential receptors are presented in Table 1. Explanation of the information in Table 1 is provided in Appendix SV-001-000, with the following additional notes.






B	For non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000.
NA	Type of effect - Generally no adverse effect
A	Type of effect - Adverse effect
S	Type of effect - Significant adverse effect
VDV	Vibration Dose Value
~	The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000).
^	The impact methodology has identified a potential significant effect at this receptor which based upon further qualitative information is not considered to be a likely significant effect. Please refer the end of this Appendix for further information.
	Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced residential community area, or individual receptor.
	Yellow denotes a low ground-borne noise impact or a minor ground-borne vibration impact
	Orange denotes a medium ground-borne noise impact or a moderate ground-borne vibration impact
	Red denotes a high ground-borne noise impact or a major ground-borne vibration impact
	Dark red denotes a very high ground-borne noise impact

Table 1: Ground-borne sound and vibration levels, noise and vibration impacts and effects

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 - 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
434142	Buttercup Close, Northolt	20	0.08	0.04	-	38	NA	R	T	-	-	-	-	
434674	Oldfield Lane North, Greenford	27	0.12	0.06	-	21	NA	R	T	-	-	-	-	
434826	Badminton Close, Northolt Mandeville	24	0.09	0.04	-	15	NA	R	T	-	-	-	-	
435453	Eastcote Lane North, Northolt	28	0.13	0.07	-	15	NA	R	T	-	-	-	-	
436084	Eastcote Lane, Northolt Mandeville	23	0.08	0.04	-	1	NA	R	T	-	-	-	-	
436260	Newbury Close, Northolt	27	0.12	0.06	-	4	NA	R	T	-	-	-	-	
436287	Newbury Close, Northolt	27	0.13	0.06	-	12	NA	R	T	-	-	-	-	
436447	Millway Gardens, Northolt	24	0.11	0.05	-	56	NA	R	T	-	-	-	-	
436911	Moat Farm Road, Northolt	21	0.08	0.04	-	11	NA	R	T	-	-	-	-	
436955	The Farmlands, Northolt	25	0.11	0.05	-	36	NA	R	T	-	-	-	-	
436990	Eastcote Lane, Northolt	24	0.10	0.05	-	10	NA	R	T	-	-	-	-	
437006	Eastcote Lane, Northolt	24	0.09	0.05	-	3	NA	R	T	-	-	-	-	
437295	Eastcote Lane & Eastcote Lane North, Northolt	30	0.16	0.08	-	41	NA	R	T	-	-	-	-	
444511	Carr Road, Northolt	21	0.07	0.04	-	43	NA	R	T	-	-	-	-	
446256	Tenby Gardens, Northolt	23	0.08	0.04	-	25	NA	R	T	-	-	-	-	
446771	Unnamed Road, Northolt Mandeville	26	0.11	0.05	-	4	NA	R	T	-	-	-	-	
446802	Badminton Close, Northolt	29	0.16	0.08	-	15	NA	R	T	-	-	-	-	
446905	The Farmlands, Northolt	24	0.10	0.05	-	48	NA	R	T	-	-	-	-	
447489	Carr Road, Northolt	24	0.10	0.05	-	39	NA	R	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
ID	Area represented													
448150	Oriel Way, Northolt	25	0.10	0.05	-	65	NA	R	T	-	-	-	-	
448166	Cherry Gardens, Northolt	26	0.11	0.06	-	16	NA	R	T	-	-	-	-	
448225	Belvue Road, Northolt	27	0.13	0.07	-	1	NA	R	T	-	-	-	-	
448236	Carr Road, Greenford Green	26	0.11	0.05	-	14	NA	R	T	-	-	-	-	
448364	The Farmlands, Northolt	23	0.09	0.05	-	18	NA	R	T	-	-	-	-	
449307	Belvue Close, Northolt	24	0.10	0.05	-	8	NA	R	T	-	-	-	-	
449395	Belvue Road, Northolt (also committed development ref CFA5/35)	19	0.07	0.04	-	39(16)	NA	R(CD)	T	-	-	-	-	
450037	Uneeda Drive, Greenford	18	0.08	0.04	-	52	NA	R	T	-	-	-	-	
450155	Belle Vue, Greenford	24	0.10	0.05	-	8	NA	R	T	-	-	-	-	
450206	Station View, Greenford	24	0.10	0.05	-	8	NA	R	T	-	-	-	-	
450222	Hill Rise, Greenford	17	0.07	0.04	-	28	NA	R	T	-	-	-	-	
453210	Hill Rise, Greenford	18	0.07	0.04	-	45	NA	R	T	-	-	-	-	
458631	Fairway Drive, Greenford	23	0.09	0.05	-	2	NA	R	T	-	-	-	-	
458783	Hill Rise, Greenford	18	0.07	0.04	-	14	NA	R	T	-	-	-	-	
465441	Rydal Crescent, Perivale	11	0.05	0.03	-	35	NA	R	T	-	-	-	-	
466600	Scorton Avenue, Perivale	17	0.06	0.03	-	6	NA	R	T	-	-	-	-	
468141	Conway Crescent, Perivale	16	0.06	0.03	-	20	NA	R	T	-	-	-	-	
468197	Conway Crescent, Perivale	23	0.09	0.04	-	36	NA	R	T	-	-	-	-	
468256	Conway Crescent, Perivale	16	0.06	0.03	-	28	NA	R	T	-	-	-	-	
468372	Bennetts Avenue, Greenford	17	0.07	0.04	-	32	NA	R	T	-	-	-	-	
469145	Lyon Way, Greenford	23	0.08	0.04	-	2	NA	R	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L _{pASmax}	VDV m/s ^{1.75} Daytime (07:00 - 23:00)	VDV m/s ^{1.75} Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
ID	Area represented													
470982	Woodhouse Avenue, Perivale	22	0.07	0.04	-	57	NA	R	T	-	-	-	-	
476961	Sunley Gardens, Perivale	18	0.06	0.03	-	12	NA	R	T	-	-	-	-	
477019	Sunley Gardens, Perivale	20	0.07	0.03	-	3	NA	R	T	-	-	-	-	
478535	Wadsworth Road, Perivale	28	0.14	0.07	-	1	NA	R	T	-	-	-	-	
478652	Rydal Crescent, Perivale	15	0.06	0.03	-	37	NA	R	T	-	-	-	-	
478670	Rydal Crescent, Perivale	15	0.06	0.03	-	8	NA	R	T	-	-	-	-	
478856	Bideford Avenue, Perivale	17	0.06	0.03	-	4	NA	R	T	-	-	-	-	
478860	Bideford Avenue, Perivale	11	0.05	0.03	-	5	NA	R	T	-	-	-	-	
478905	Tavistock Avenue, Perivale	15	0.06	0.03	-	20	NA	R	T	-	-	-	-	
479664	Selborne Gardens, Perivale	19	0.06	0.03	-	8	NA	R	T	-	-	-	-	
479684	Selborne Gardens, Perivale	18	0.06	0.03	-	12	NA	R	T	-	-	-	-	
479887	Selborne Gardens, Perivale	23	0.08	0.04	-	16	NA	R	T	-	-	-	-	
479934	Selborne Gardens, Perivale	22	0.08	0.04	-	16	NA	R	T	-	-	-	-	
479992	Horsenden Lane South, Perivale	23	0.08	0.04	-	4	NA	R	T	-	-	-	-	
480047	Chilham Close, Perivale	18	0.06	0.03	-	6	NA	R	T	-	-	-	-	
480059	Horsenden Lane South, Perivale	12	0.05	0.03	-	6	NA	R	T	-	-	-	-	
480109	Tavistock Avenue, Perivale	12	0.05	0.02	-	13	NA	R	T	-	-	-	-	
480906	Selborne Gardens, Perivale	28	0.13	0.06	-	3	NA	R	T	-	-	-	-	
480916	Horsenden Lane South, Perivale	26	0.11	0.06	-	8	NA	R	T	-	-	-	-	
481685	Alpertons Lane, Wembley	20	0.06	0.03	-	1	NA	R	T	-	-	-	-	
481746	Alpertons Lane, Wembley	24	0.08	0.04	-	4	NA	R	T	-	-	-	-	
481766	May Gardens, Wembley	20	0.07	0.04	-	6	NA	R	T	-	-	-	-	
481789	May Gardens, Wembley	22	0.08	0.04	-	11	NA	R	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L _{pASmax}	VDV m/s ^{1.75} Daytime (07:00 - 23:00)	VDV m/s ^{1.75} Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
ID	Area represented													
481879	Rydal Crescent, Perivale	10	0.04	0.02	-	14	NA	R	T	-	-	-	-	
481961	Rydal Crescent, Perivale	14	0.05	0.03	-	38	NA	R	T	-	-	-	-	
482061	Rydal Crescent, Perivale	9	0.04	0.02	-	45	NA	R	T	-	-	-	-	
489133	May Gardens, Wembley	16	0.06	0.03	-	23	NA	R	T	-	-	-	-	
489183	May Gardens, Wembley	19	0.07	0.03	-	4	NA	R	T	-	-	-	-	
489276	Lily Gardens, Wembley	13	0.05	0.02	-	21	NA	R	T	-	-	-	-	
489706	Lily Gardens, Wembley	17	0.06	0.03	-	2	NA	R	T	-	-	-	-	
491973	Hanger Lane (North Circular Road), Hanger Hill	11	0.02	0.01	-	9	NA	R	T	-	-	-	-	
491989	Ritz Parade, London	6	0.02	0.01	-	8	NA	R	T	-	-	-	-	
492015	Bispham Road, London (also committed development ref CFA5/16)	10	0.02	0.01	-	24(2)	NA	R(CD)	T	-	-	-	-	
492062	Rossall Crescent, London	8	0.02	0.01	-	4	NA	R	T	-	-	-	-	
492095	Twyford Abbey Road, London	6	0.02	0.01	-	10	NA	R	T	-	-	-	-	
492184	Rossall Crescent, London	9	0.02	0.01	-	16	NA	R	T	-	-	-	-	
492185	Rossall Crescent, London	6	0.02	0.01	-	25	NA	R	T	-	-	-	-	
493385	Lynwood Road, London	8	0.03	0.01	-	15	NA	R	T	-	-	-	-	
493412	Greystoke Park Terrace, London	8	0.03	0.01	-	14	NA	R	T	-	-	-	-	
493528	Royal Parade, London	7	0.02	0.01	-	16	NA	R	T	-	-	-	-	
504699	Coronation Road, London	10	0.02	0.01	-	10	NA	R	T	-	-	-	-	
505630	Western Avenue, London	14	0.03	0.01	-	50	NA	R	T	-	-	-	-	
517439	Western Avenue, London	12	0.02	0.01	-	15	NA	R	T	-	-	-	-	
549409	Carr Road, Northolt	29	0.15	0.08	-	64	NA	R	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
ID	Area represented													
621916	Western Avenue, London	6	0.01	0.01	-	8	NA	R	T	-	-	-	-	
621917	Western Avenue, London	9	0.02	0.01	-	9	NA	R	T	-	-	-	-	
621920	Park Royal Road, East Acton	13	0.02	0.01	-	9	NA	R	T	-	-	-	-	
621968	Wilsmere Drive, Northolt	24	0.09	0.05	-	8	NA	R	T	-	-	-	-	
621970	Wilsmere Drive, Northolt	25	0.10	0.05	-	6	NA	R	T	-	-	-	-	
621977	Newbury Close, Northolt	27	0.13	0.06	-	16	NA	R	T	-	-	-	-	
621978	Newbury Way, Northolt	29	0.15	0.08	-	12	NA	R	T	-	-	-	-	
621979	Wilsmere Drive, Northolt	26	0.11	0.06	-	7	NA	R	T	-	-	-	-	
621980	Wilsmere Drive, Northolt	29	0.15	0.07	-	4	NA	R	T	-	-	-	-	
621981	Newbury Way, Northolt	28	0.14	0.07	-	12	NA	R	T	-	-	-	-	
621982	Newbury Way, Northolt	25	0.10	0.05	-	7	NA	R	T	-	-	-	-	
621983	Newbury Close, Northolt	23	0.08	0.04	-	4	NA	R	T	-	-	-	-	
621985	Sandown Way, Northolt	22	0.08	0.04	-	9	NA	R	T	-	-	-	-	
621986	Wilsmere Drive, Northolt	24	0.09	0.05	-	6	NA	R	T	-	-	-	-	
621987	Wilsmere Drive, Northolt	26	0.12	0.06	-	3	NA	R	T	-	-	-	-	
434674	Ockham Drive, Greenford (Shopping)	27	0.12	0.06	-	2	B	G ₄ /V ₃	T	-	-	-	-	
434826	Icknield Court, Mandeville Road, Northolt (Restaurant)	24	0.09	0.04	-	1	B	G ₄ /V ₃	T	-	-	-	-	
435453	Northolt Leisure Centre, Eastcote Lane North (Leisure Centre)	28	0.13	0.07	-	1	B	G ₄ /V ₃	T	-	-	-	-	
437006	Northolt Park Baptist Church, Eastcote Lane (Church)	24	0.09	0.05	-	1	B	G ₃ /V ₃	T	-	-	-	-	
437295	Northolt High School, Northolt	30	0.16	0.08	-	1	B	G ₄ /V ₃	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 - 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
ID	Area represented													
	(School)													
448225	Northolt Trading Estate, Belvue Road (General Commercial)	27	0.13	0.07	-	1	B	G4/V3	T	-	-	-	-	
448225	Northolt Trading Estate, Belvue Road, Northolt (Shopping)	27	0.13	0.07	-	1	B	G4/V3	T	-	-	-	-	
448225	Belvue Road, Northolt (General Commercial)	27	0.13	0.07	-	1	B	G4/V3	T	-	-	-	-	
448225	Belvue Road, Northolt (General Commercial)	27	0.13	0.07	-	1	B	G4/V3	T	-	-	-	-	
448225	Belvue Road, Northolt (Shopping)	27	0.13	0.07	-	2	B	G4/V3	T	-	-	-	-	
448225	Belvue Road, Northolt (General Commercial)	27	0.13	0.07	-	5	B	G4/V3	T	-	-	-	-	
448225	Belvue Road, Northolt (General Commercial)	27	0.13	0.07	-	18	B	G4/V3	T	-	-	-	-	
448225	Belvue Road, Northolt (Office)	27	0.13	0.07	-	1	B	G4/V3	T	-	-	-	-	
448225	Belvue Road, Northolt, (Office)	27	0.13	0.07	-	1	B	G4/V3	T	-	-	-	-	
448225	Belvue Road, Northolt, (Office)	27	0.13	0.07	-	4	B	G4/V3	T	-	-	-	-	
448225	Northolt, (General Commercial)	27	0.13	0.07	-	1	B	G4/V3	T	-	-	-	-	
448236	Ken Acock Youth & Community Centre, Carr Road (Community Centre)	26	0.11	0.05	-	1	B	G3/V3	T	-	-	-	-	
450037	Oldfield Lane North, Greenford,	18	0.08	0.04	-	3	B		T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L _{pASmax}	VDV m/s ^{1.75} Daytime (07:00 - 23:00)	VDV m/s ^{1.75} Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
	(General Commercial)							G4/V3						
450037	Artmaster Gallery, Oldfield Lane North, Greenford (Art Gallery)	18	0.08	0.04	-	1	B	G3/V3	T	-	-	-	-	
450037	Oldfield Lane North, Greenford (Café)	18	0.08	0.04	-	2	B	G4/V3	T	-	-	-	-	
450037	Oldfield Lane North, Greenford, (Car Dealer)	18	0.08	0.04	-	1	B	G4/V3	T	-	-	-	-	
450206	London Underground Ltd, Oldfield Lane North (General Commercial)	24	0.10	0.05	-	3	B	G4/V3	T	-	-	-	-	
450222	Oldfield Lane North, Greenford, (General Commercial)	17	0.07	0.04	-	1	B	G4/V3	T	-	-	-	-	
450222	Oldfield Lane North, Greenford, (Shopping)	17	0.07	0.04	-	1	B	G4/V3	T	-	-	-	-	
450222	Oldfield Lane North, Greenford, (Shopping)	17	0.07	0.04	-	1	B	G4/V3	T	-	-	-	-	
450222	Post Office, Oldfield Lane North, Greenford (Post Office)	17	0.07	0.04	-	1	B	G4/V3	T	-	-	-	-	
450222	Oldfield Lane North, Greenford, (General Commercial)	17	0.07	0.04	-	2	B	G4/V3	T	-	-	-	-	
450222	Oldfield Lane North, Greenford, (General Commercial)	17	0.07	0.04	-	1	B	G4/V3	T	-	-	-	-	
450222	Oldfield Lane North, Greenford, (General Commercial)	17	0.07	0.04	-	1	B	G4/V3	T	-	-	-	-	
457997	Railway Hotel, Knights Court, Oldfield Lane North (Hotel)	26	0.11	0.05	-	1	A	G4/V2	T	-	-	-	-	
457997	Oldfield Lane North, Greenford, (General Commercial)	26	0.11	0.05	-	2	B	G4/V3	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
458097	Station Approach, Oldfield Lane North, Greenford, (Office)	34	0.25	0.13	-	8	B	G4/V3	T	-	-	-	-	
458631	Fairway Drive, Greenford, (General Commercial)	23	0.09	0.05	-	3	B	G4/V3	T	-	-	-	-	
465140	Lakeside Drive, Park Royal, London, (General Commercial)	6	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
469145	Turnpike House, Lyon Way, Greenford, (Shopping)	23	0.08	0.04	-	1	B	G4/V3	T	-	-	-	-	
469145	Lyon Way, Greenford, (Office)	23	0.08	0.04	-	8	B	G4/V3	T	-	-	-	-	
469145	Lyon Way, Greenford, (Café)	23	0.08	0.04	-	1	B	G4/V3	T	-	-	-	-	
469314	Green Park Way, Greenford, (Factory)	32	0.21	0.10	-	1	B	G4/V4	T	-	-	-	-	
469314	Rockware Avenue, Greenford, (General Commercial)	32	0.21	0.10	-	4	B	G4/V3	T	-	-	-	-	
469314	Sears Retail Park, Greenford Road, Greenford, (Shopping)	32	0.21	0.10	-	1	B	G4/V3	T	-	-	-	-	
469314	Sears Retail Park, Greenford Road, Greenford, (Shopping)	32	0.21	0.10	-	1	B	G4/V3	T	-	-	-	-	
469314	Sears Retail Park, Greenford Road, Greenford, (Travel Agency)	32	0.21	0.10	-	1	B	G4/V3	T	-	-	-	-	
469314	Sears Retail Park, Greenford Road, Greenford, (Shopping)	32	0.21	0.10	-	4	B	G4/V3	T	-	-	-	-	
469314	Sears Retail Park, Greenford Road, Greenford, (Shopping)	32	0.21	0.10	-	1	B	G4/V3	T	-	-	-	-	
478535	Bideford Avenue, Perivale, (General	28	0.14	0.07	-	6	B		T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
	Commercial)							G4/V3						
478535	Deltec House, Bideford Avenue, Perivale, (Engineering Works)	28	0.14	0.07	-	1	B	G4/V4	T	-	-	-	-	
478535	Bideford Avenue, Perivale (Office)	28	0.14	0.07	-	1	B	G4/V3	T	-	-	-	-	
478535	Wadsworth Road, Perivale (General Commercial)	28	0.14	0.07	-	1	B	G4/V3	T	-	-	-	-	
478535	Bizspace Business Centre, Wadsworth Road (General Commercial)	28	0.14	0.07	-	27	B	G4/V3	T	-	-	-	-	
478856	Busy Bees Nursery, Bideford Avenue (Children's Nursery)	17	0.06	0.03	-	1	B	G4/V3	T	-	-	-	-	
479272	Fleetway Business Park, Wadsworth Road, Perivale, (General Commercial)	25	0.11	0.05	-	6	B	G4/V3	T	-	-	-	-	
479272	Fleetway Business Park, Wadsworth Road, Perivale, (General Commercial)	25	0.11	0.05	-	1	B	G4/V3	T	-	-	-	-	
479272	Sheraton Business Centre, Wadsworth Road, Perivale, (General Commercial)	25	0.11	0.05	-	11	B	G4/V3	T	-	-	-	-	
479272	Wadsworth Close, Perivale, (Trade Distribution)	25	0.11	0.05	-	2	B	G4/V3	T	-	-	-	-	
479841	Perivale Park, Horsenden Lane South, Perivale (Television Studio)	-	0.06	0.03	-	2	Q	G2/V3	T	-	-	-	-	
480916	Scout Headquarters, Horsenden Lane (Scouts Meeting Place)	30	0.19	0.10	-	1	B	G4/V3	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
480945	Bideford Avenue, Perivale (Shopping)	27	0.11	0.06	-	2	B	G4/V3	T	-	-	-	-	
480945	Perivale Park, Horsenden Lane South, Perivale, (Office)	27	0.11	0.06	-	4	B	G4/V3	T	-	-	-	-	
480945	Newton Works, Bideford Avenue, Perivale, (General Commercial)	27	0.11	0.06	-	1	B	G4/V3	T	-	-	-	-	
480945	Bideford Avenue, Perivale, (General Commercial)	27	0.11	0.06	-	1	B	G4/V3	T	-	-	-	-	
480945	Bideford Avenue, Perivale (Car Dealer)	27	0.11	0.06	-	1	B	G4/V3	T	-	-	-	-	
480945	Bideford Avenue, Perivale (General Commercial)	27	0.11	0.06	-	1	B	G4/V3	T	-	-	-	-	
480945	Perivale Park, Horsenden Lane South, Perivale (Office)	27	0.11	0.06	-	1	B	G4/V3	T	-	-	-	-	
480945	Perivale Park, Horsenden Lane South (TV Studio)	27	0.11	0.06	-	3	B	G2/V1	T	-	-	-	-	
481685	Marsh Road, Wembley (General Commercial)	20	0.06	0.03	-	1	B	G4/V3	T	-	-	-	-	
481685	Alperton Lane, Wembley (General Commercial)	20	0.06	0.03	-	1	B	G4/V3	T	-	-	-	-	
481685	Westlinks, Alperton Lane, Wembley (General Commercial)	20	0.06	0.03	-	4	B	G4/V3	T	-	-	-	-	
481879	Alperton Lane, Perivale, (Office)	10	0.04	0.02	-	1	B	G4/V3	T	-	-	-	-	
489151	Perivale Methodist Church, May Gardens, Wembley (Church)	14	0.05	0.02	-	1	B	G3/V3	T	-	-	-	-	
490357	Wadsworth Road, Perivale, (General	14	0.05	0.02	-	2	B		T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
	Commercial)							G4/V3						
490357	Vicars Green Primary School, Lily Gardens (Primary School)	14	0.05	0.02	-	1	B	G4/V3	T	-	-	-	-	
490357	Wadsworth Road, Perivale, (General Commercial)	14	0.05	0.02	-	1	B	G4/V3	T	-	-	-	-	
490357	Silicon Business Centre, Wadsworth Road, Perivale, (Office)	14	0.05	0.02	-	1	B	G4/V3	T	-	-	-	-	
491989	Ritz Parade, London, (General Commercial)	6	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
491989	Ritz Parade, London, (General Commercial)	6	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
491989	Post Office, Ashbourne Parade, London, (Post Office)	6	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
491989	Premier Inn, Ritz Parade, London, (Inn)	6	0.02	0.01	-	1	B	G4/V2	T	-	-	-	-	
491989	Ritz Parade, London, (General Commercial)	6	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
491989	Ashbourne Parade, London (Office)	6	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
493385	Doctors Surgery, Greystoke Park Terrace, London (Surgery)	8	0.03	0.01	-	1	B	G4/V2	T	-	-	-	-	
493486	Crown Plaza Hotel, Western Avenue, London (Hotel)	6	0.02	0.01	-	1	A	G4/V2	T	-	-	-	-	
493528	Royal Parade, London (General Commercial)	7	0.02	0.01	-	7	B	G4/V3	T	-	-	-	-	
494208	West Gate, London, (General Commercial)	17	0.04	0.02	-	9	B	G4/V3	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 - 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
ID	Area represented													
494208	Westgate House, West Gate, London, (Entertainment Centre)	17	0.04	0.02	-	18	Q	G2/V1	T	-	-	-	-	
494242	A G B House, West Gate, London, (General Commercial)	10	0.03	0.01	-	1	B	G4/V3	T	-	-	-	-	
494242	Chelsea House, West Gate, London (Office)	10	0.03	0.01	-	5	B	G4/V3	T	-	-	-	-	
494242	Westworld, West Gate, London (General Commercial)	10	0.03	0.01	-	5	B	G4/V3	T	-	-	-	-	
504699	Coronation Road, London (Auction House)	10	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
504699	Sovereign Park, Coronation Road London, (Office)	10	0.02	0.01	-	19	B	G4/V3	T	-	-	-	-	
504699	Park Royal Metro Centre, Britannia Way, London (Office)	10	0.02	0.01	-	16	B	G4/V3	T	-	-	-	-	
504699	Coronation Road, London (General Commercial)	10	0.02	0.01	-	4	B	G4/V3	T	-	-	-	-	
504699	Leeborn House, Coronation Road, London (General Commercial)	10	0.02	0.01	-	2	B	G4/V3	T	-	-	-	-	
504699	Vascroft Estate, Coronation Road, London (General Commercial)	10	0.02	0.01	-	8	B	G4/V3	T	-	-	-	-	
504699	Johnsons Way, London, (Car Hire)	10	0.02	0.01	-	15	B	G4/V3	T	-	-	-	-	
504699	Granville Works, Coronation Road, London, (Office)	10	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
504699	Light House, Western Road, London, (General Commercial)	10	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
504699	Western Road, London, (Office)	10	0.02	0.01	-	1	B		T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
ID	Area represented													
								G4/V3						
504699	Britannia Way, Coronation Road, London, (General Commercial)	10	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
504699	Trading Estate Road, London, (General Commercial)	10	0.02	0.01	-	7	B	G4/V3	T	-	-	-	-	
504699	Trading Estate Road, London, (General Commercial)	10	0.02	0.01	-	4	B	G4/V3	T	-	-	-	-	
504699	Park Royal Road, London, (Food And Drink Manufacture)	10	0.02	0.01	-	1	B	G4/V4	T	-	-	-	-	
504699	Park Royal Road, London, (Office)	10	0.02	0.01	-	4	B	G4/V3	T	-	-	-	-	
505630	Western Avenue, London, (General Commercial)	14	0.03	0.01	-	3	B	G4/V3	T	-	-	-	-	
505630	Western Avenue, London, (Office)	14	0.03	0.01	-	2	B	G4/V3	T	-	-	-	-	
505630	Travelodge, Western Avenue, London (Hotel)	14	0.03	0.01	-	1	A	G4/V2	T	-	-	-	-	
505690	West Five Centre, Western Avenue, London, (Shopping)	7	0.02	0.01	-	1	B	G4/V3	T	-	-	-	-	
621918	Lower Park Trading Estate, Park Royal Road, London (Office)	14	0.02	0.01	-	2	B	G4/V3	T	-	-	-	-	
621918	Lower Park Trading Estate, Park Royal Road, London (Shopping)	14	0.02	0.01	-	2	B	G4/V3	T	-	-	-	-	
621947	The Phoenix Centre, Lord Halsbury Playing Fields (General Commercial)	20	0.08	0.04	-	1	B	G4/V3	T	-	-	-	-	

Impact summary

- 4.3.3 The operational ground-borne noise and vibration impacts identified in Table 1 are summarised in Table 2.

Table 2: Summary of operational ground-borne noise and vibration impacts

	Number of ground-borne noise impacts			
	Low	Medium	High	Very High
Residential properties	0	0	0	0
Non-residential properties	1			0
	Number of ground-borne vibration impacts			
	Minor	Moderate	Major	Risk of building damage
Residential properties	0	0	0	0
Non-residential properties	0			

Airborne sound: direct impacts and effects

- 4.3.4 The route is in tunnel through this study area and therefore no operational airborne noise assessment has been undertaken.

4.4 Assessment of impacts and effects

Residential receptors: direct effects

- 4.4.2 The assessment of operational noise and vibration indicates that significant direct effects on residential receptors are unlikely to occur in this area.

Residential receptors: indirect effects

- 4.4.3 The transport assessment presented in Volume 5: Appendix TR-001-000, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5: Appendix SV-001-000. No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 have been identified in this study area.
- 4.4.4 The assessment of operational noise and vibration indicates that significant indirect effects on residential receptors are unlikely to occur in this area.

Non-residential receptors: direct effects

- 4.4.5 The assessment of operational noise and vibration indicates that significant direct effects on non-residential receptors are unlikely to occur in this area.

Non-residential receptors: indirect effects

- 4.4.6 The transport assessment presented in Volume 5: Appendix TR-001-000, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5: Appendix SV-001-000. No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 have been identified in this study area.
- 4.4.7 The assessment of operational noise and vibration indicates that significant indirect effects are unlikely to occur on non-residential receptors in this area.

Cumulative effects

- 4.4.8 Details of properties being currently developed which were afforded planning approval before the safeguarding date are presented in Volume 5: Appendix CToo4-000. Within this area, the operational sound, noise or vibration associated with these developments in conjunction with the operation of the Proposed Scheme do not result in any significant cumulative effects.